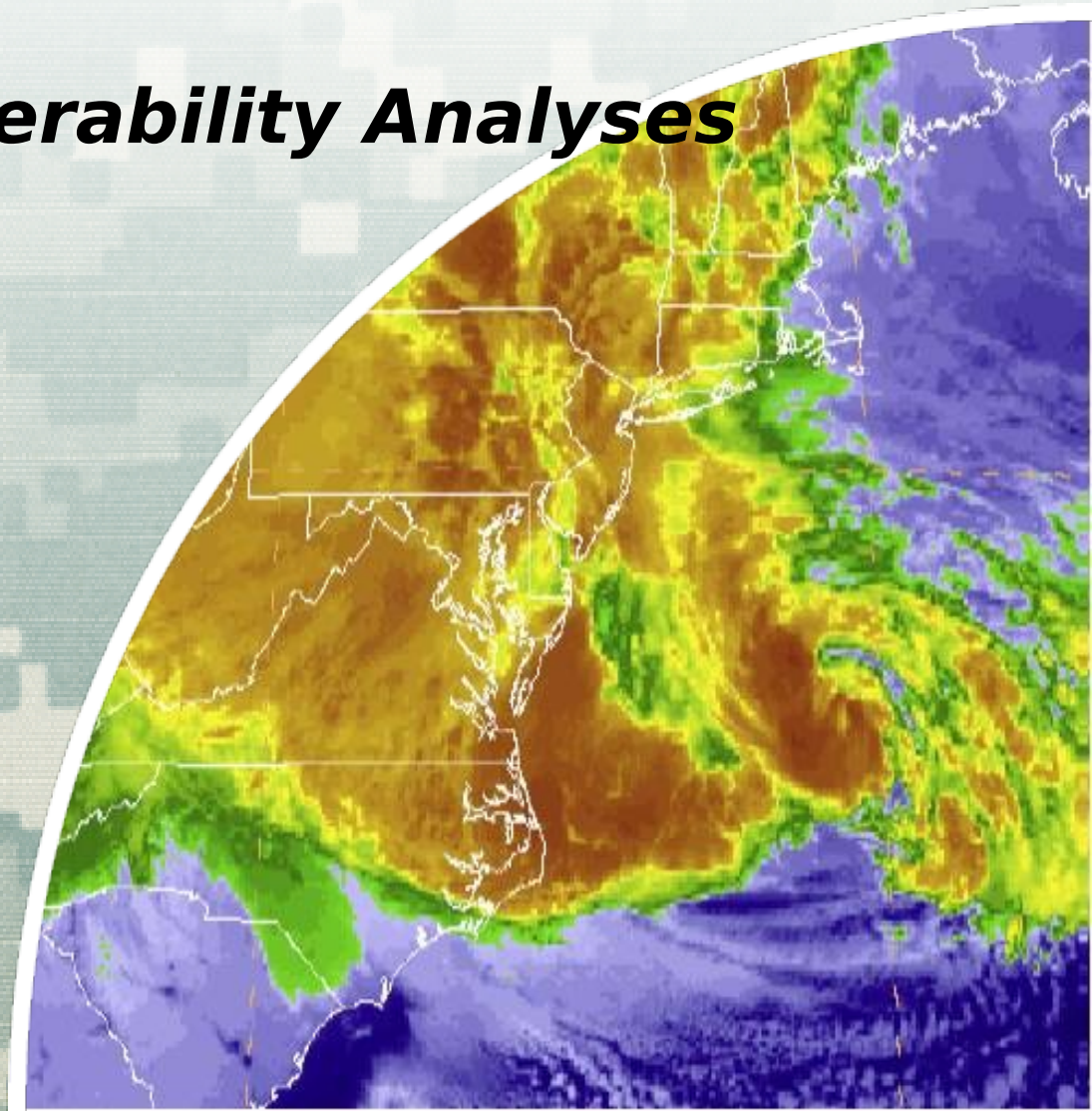
North Atlantic Coast Comprehensive Study

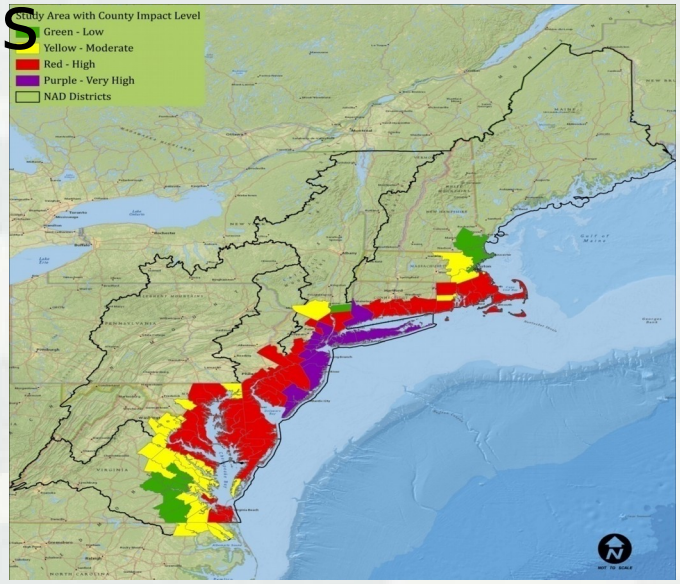
Application of Vulnerability Analyses



U.S. Army Corps of Engineers
Coastal Storm Risk Management
Planning Center of Expertise
25 September 2013

Context

- **Coastal Framework**
  - Regional scale
  - Opportunities by reach/state
  - Identify range of potential solutions/measures reach/state
  - State Narrative Appendices
  - Plan Formulation

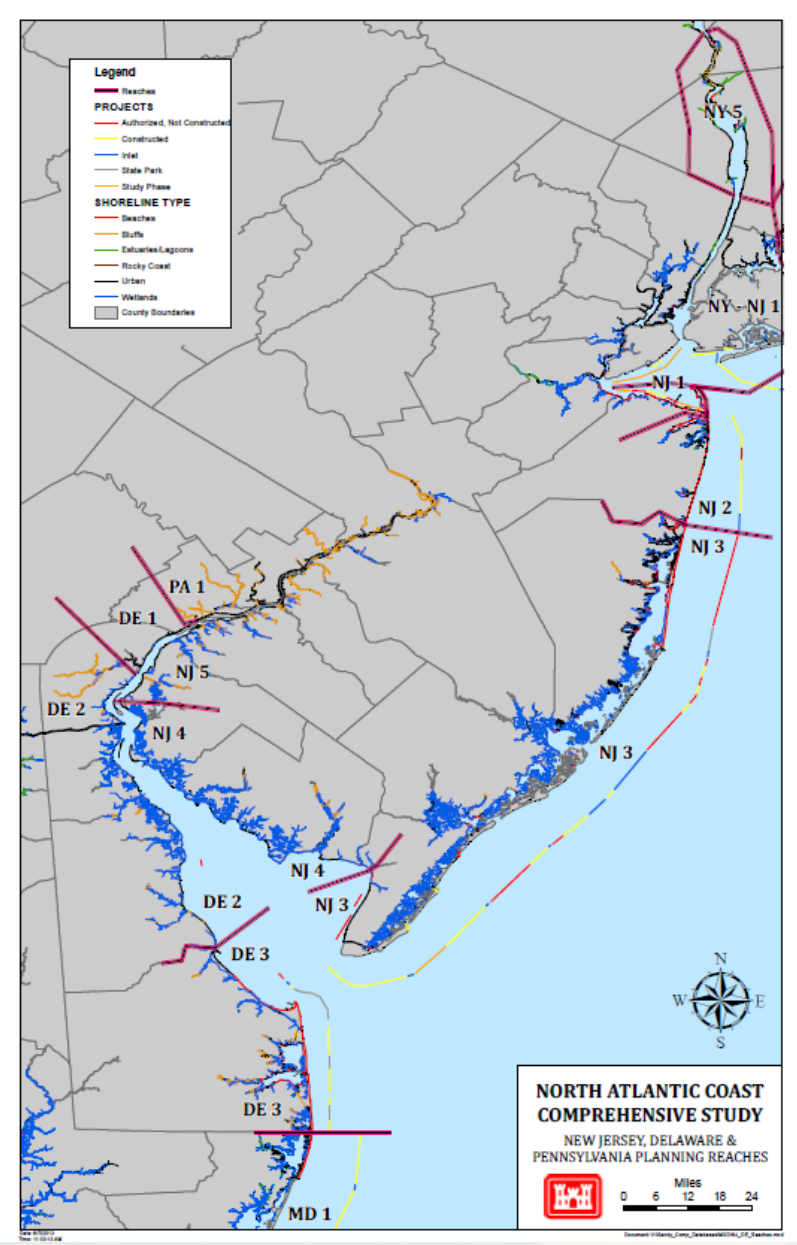


Plan Formulation

- Existing/future conditions and projects
- Sea level rise and inundation mapping
- Planning reaches
- Existing and ongoing plans by others
- Risk exposure assessment/mapping
  - Identify areas of high exposure
- Strategies/opportunities to manage risk
- Range of appropriate risk reduction measures

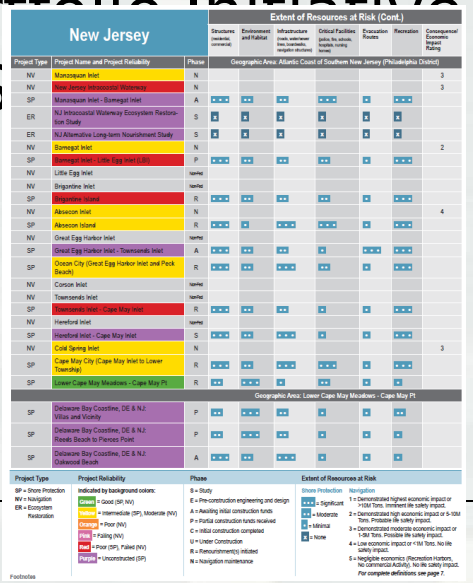
Study Area - Reaches

- 38 Reaches defined by:
  - Physiographic/geographic characteristics (shoreline type)
  - USACE and other shore protection projects
  - Land use
  - Jurisdictions



USACE Project Map

- Existing USACE projects
- Considered in the Without Project Condition
- From PL 113-2 Interim 1 and 2 Reports and The Coastal Systems Portfolio Initiative (CS



New Jersey	Extent of Resources at Risk (Cont.)						
	Structures (residential, commercial)	Environment and Habitat	Infrastructure (roads, waterways/ lines, boardwalks, navigation structures)	Critical Facilities (police, fire, schools, hospitals, nursing homes)	Evacuation Routes	Recreation	Consequence Economic Impact Ranking
Project Type / Project Name and Project Reliability / Phase	Geographic Area: Atlantic Coast of Southern New Jersey (Philadelphia District)						
NV Manasquan Inlet N							3
NV New Jersey Intracoastal Waterway N							3
SP Manasquan Inlet - Barnegat Inlet A	▪▪▪	▪▪	▪▪	▪▪▪	▪	▪▪▪	
ER NJ Intracoastal Waterway Ecosystem Restoration Study S	▪	▪	▪	▪	▪	▪	
ER NJ Alternative Long-term Nourishment Study S	▪	▪	▪	▪	▪	▪	
NV Barnegat Inlet N							2
SP Barnegat Inlet - Little Egg Inlet (LBI) P	▪▪▪	▪▪	▪▪	▪▪	▪	▪▪▪	
NV Little Egg Inlet (partial)							
NV Brigantine Inlet (partial)							
SP Brigantine Inlet R	▪▪▪	▪▪	▪▪	▪▪	▪	▪▪▪	
NV Absecon Inlet N							4
SP Absecon Island R	▪▪▪	▪	▪▪▪	▪▪▪	▪	▪▪▪	
NV Great Egg Harbor Inlet (partial)							
SP Great Egg Harbor Inlet - Townsends Inlet A	▪▪▪	▪▪	▪▪	▪	▪▪▪	▪▪▪	
SP Ocean City (Great Egg Harbor Inlet and Peck Beach) R	▪▪▪	▪▪	▪▪▪	▪▪	▪	▪▪▪	
NV Corson Inlet (partial)							
NV Townsends Inlet (partial)							
SP Townsends Inlet - Cape May Inlet R	▪▪▪	▪▪	▪▪	▪	▪	▪▪▪	
NV Hereford Inlet (partial)							
SP Hereford Inlet - Cape May Inlet S	▪▪▪	▪▪	▪▪▪	▪	▪	▪▪▪	
NV Cold Spring Inlet N							3
SP Cape May City (Cape May Inlet to Lower Township) R	▪▪▪	▪▪	▪▪▪	▪▪▪	▪	▪▪▪	
SP Lower Cape May Meadows - Cape May Pt R	▪▪	▪▪▪	▪	▪▪	▪	▪	
Geographic Area: Lower Cape May Meadows - Cape May Pt							
SP Delaware Bay Coastline, DE & NJ: Villas and Vicinity P	▪▪	▪▪▪	▪▪	▪	▪	▪▪	
SP Delaware Bay Coastline, DE & NJ: Reeds Beach to Pierces Point P	▪▪	▪▪▪	▪▪	▪	▪	▪▪	
SP Delaware Bay Coastline, DE & NJ: Oakwood Beach A	▪▪▪	▪▪	▪▪▪	▪	▪	▪	

Project Type: SP = Shore Protection; NV = Navigation; ER = Ecosystem Restoration

Project Reliability (indicated by background colors): Yellow = Good (SP, NV); Yellow = Intermediate (SP), Moderate (NV); Orange = Poor (NV); Red = Failing (NV); Red = Poor (SP), Failed (NV); Purple = Unconstructed (SP)

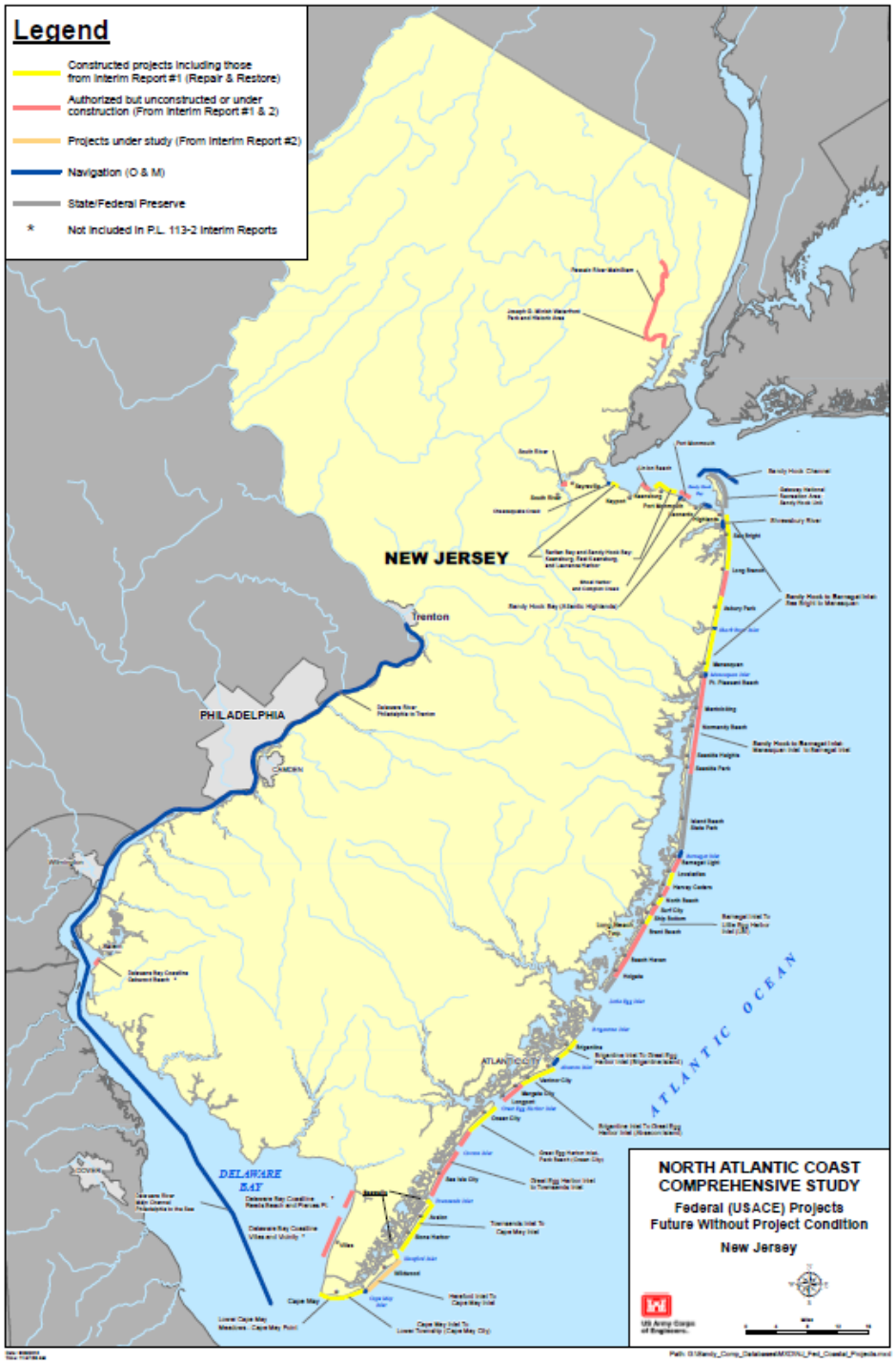
Phase: S = Study; E = Pre-construction engineering and design; A = Awaiting initial construction funds; P = Partial construction funds received; C = Initial construction completed; U = Under Construction; R = Renourishment(s) initiated; N = Navigation maintenance

Extent of Resources at Risk: ▪▪▪ = Significant; ▪▪ = Moderate; ▪ = Minimal; ▪ = None

Shore Protection / Navigation: 1 = Demonstrated highest economic impact or >10M Tons. Imminent life safety impact. 2 = Demonstrated high economic impact or 5-10M Tons. Probable life safety impact. 3 = Demonstrated moderate economic impact or 1-5M Tons. Possible life safety impact. 4 = Low economic impact or <1M Tons. No life safety impact. 5 = Negligible economics (Recreation Harbors. No commercial Activity). No life safety impact.

For complete definitions see page 7.

Footnotes


Legend
Constructed projects including those from Interim Report #1 (Repair & Restore)
Authorized but unconstructed or under construction (From Interim Report #1 & 2)
Projects under study (From Interim Report #2)
Navigation (O & M)
State/Federal Preserve
* Not included in P.L. 113-2 Interim Reports
NEW JERSEY
PHILADELPHIA
Trenton
ATLANTIC CITY
DELAWARE BAY
ATLANTIC OCEAN
NORTH ATLANTIC COAST COMPREHENSIVE STUDY
Federal (USACE) Projects
Future Without Project Condition
New Jersey

NJ State Project Map

- Existing State projects
- Considered in the Without Project Condition
- Integrate other agency strategies/regional plans
  - PlaNYC report
  - Joint Field Offices State Recovery Support Strategies
  - Hurricane Sandy Rebuilding Task Force

Exposure Assessment

***Composite Exposure Index**

***Infrastructure + Population**

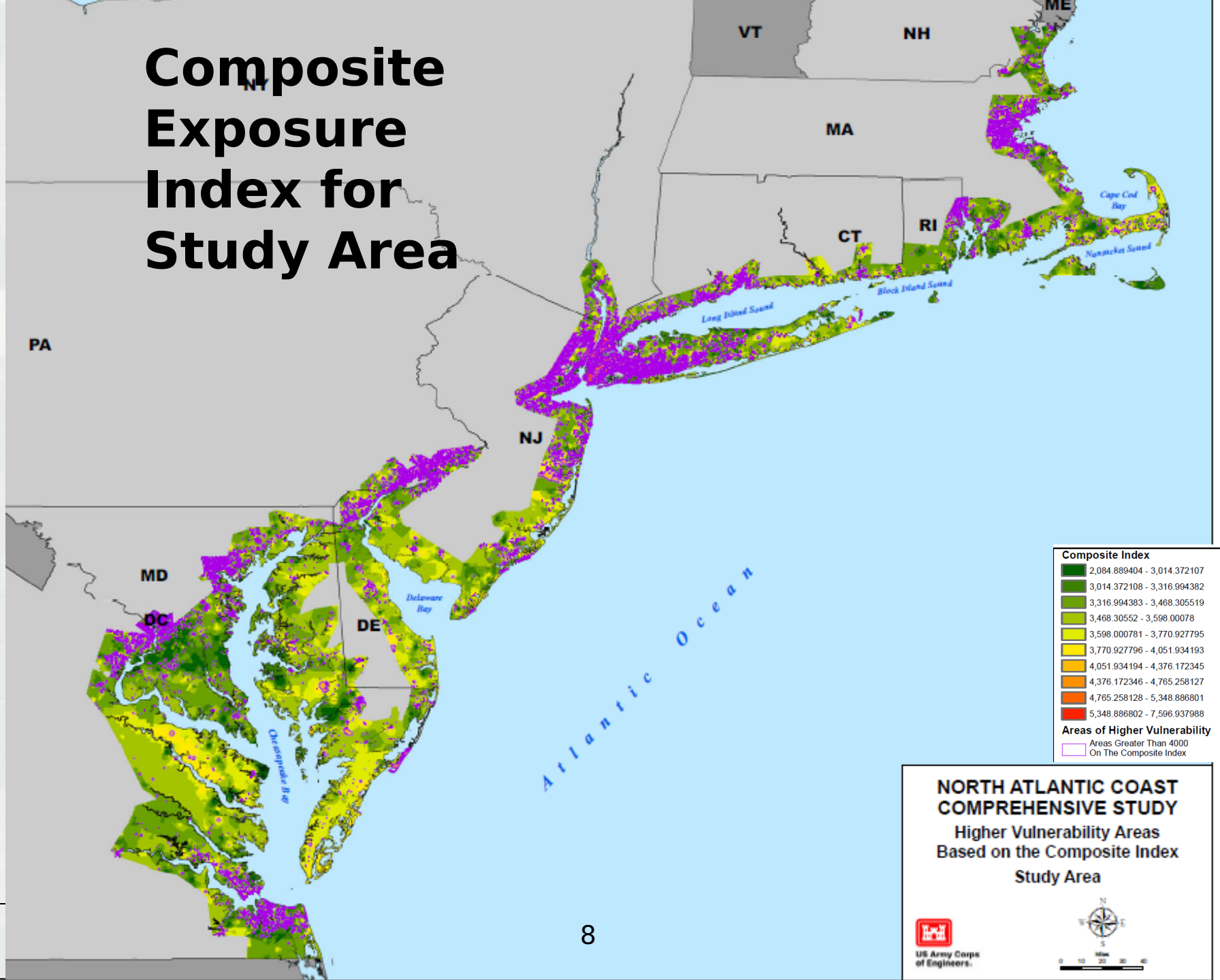
***Social**

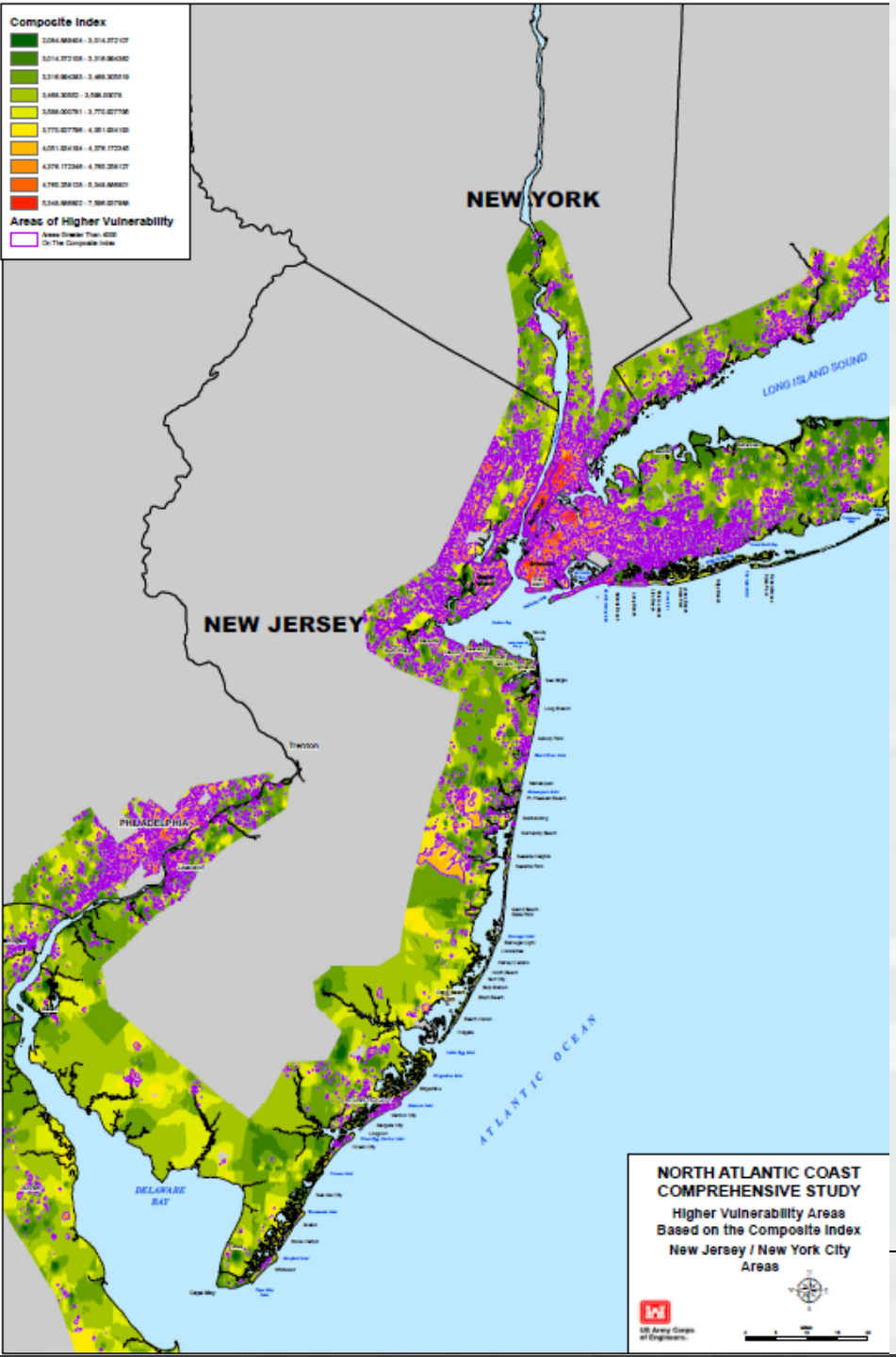
-2010 Census (tract level)
-% Population 65 and over
-% Population under 5
-% Population w/income below poverty
-% Population non-proficient English speakers
-Index of income inequality

***Environmental and Cultural**

***USGS Coastal Vulnerability Index**

Composite Exposure Index for Study Area

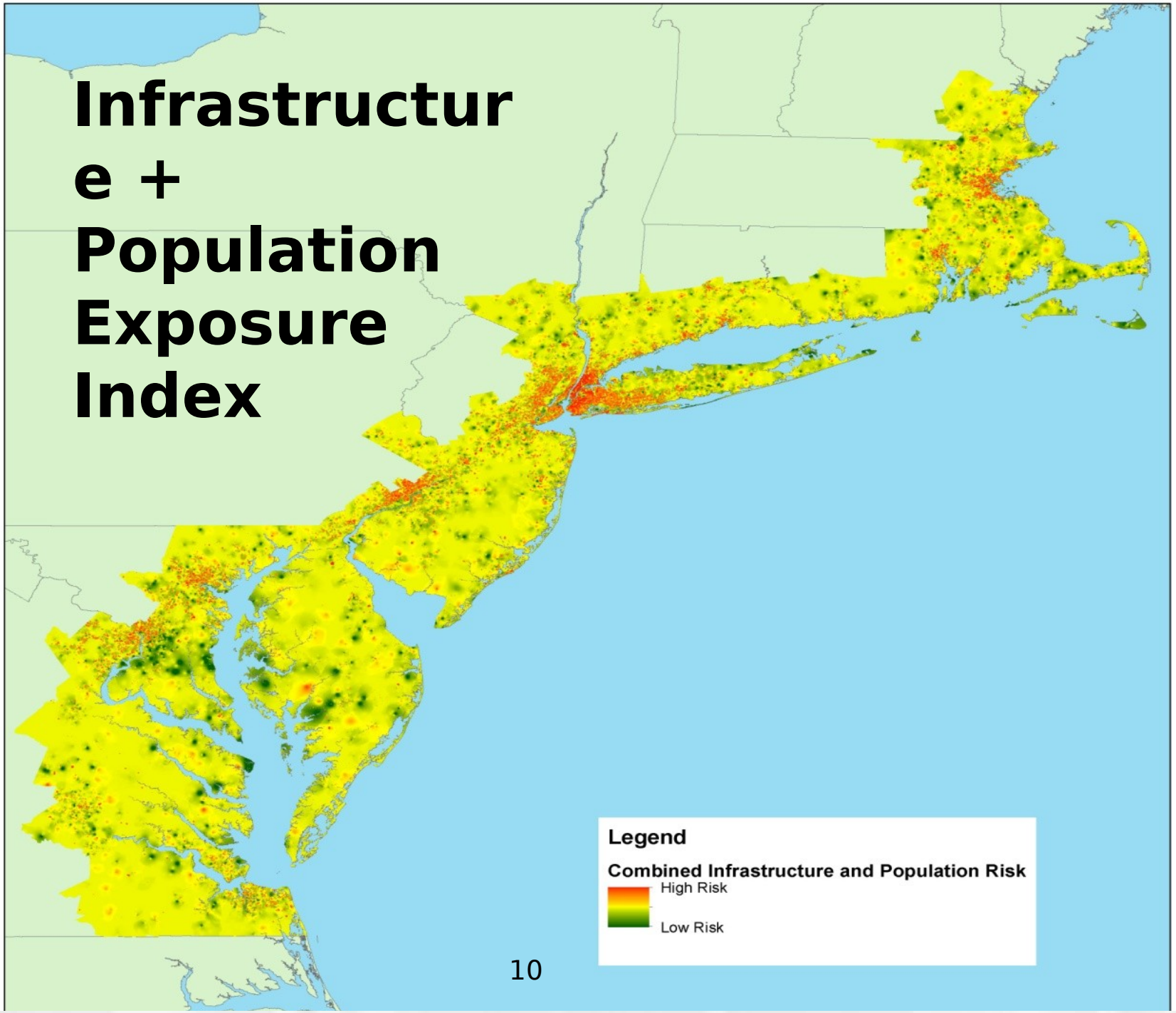




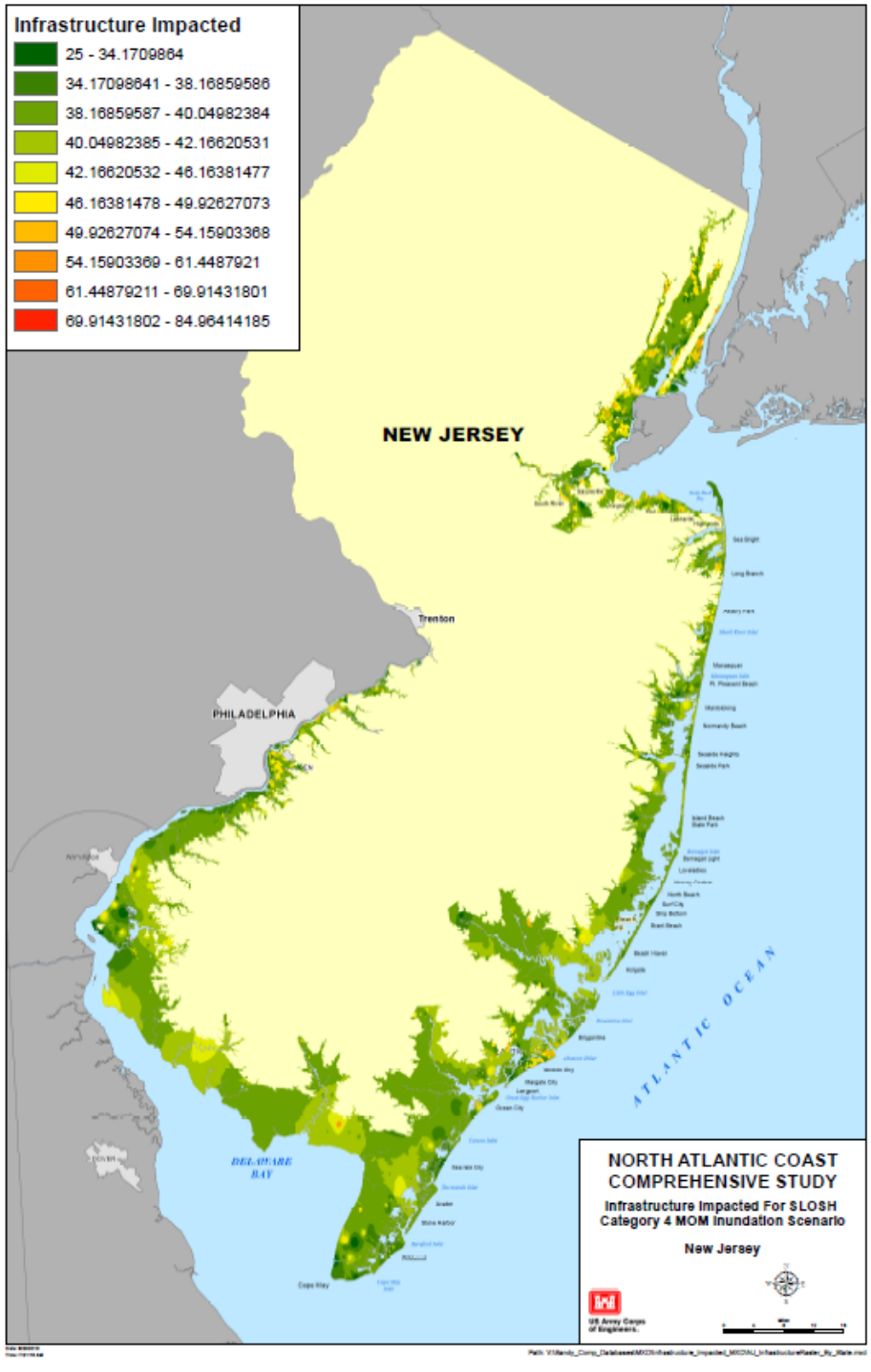
Composite Exposure Index : State of New Jersey

BUILDING STRONG®

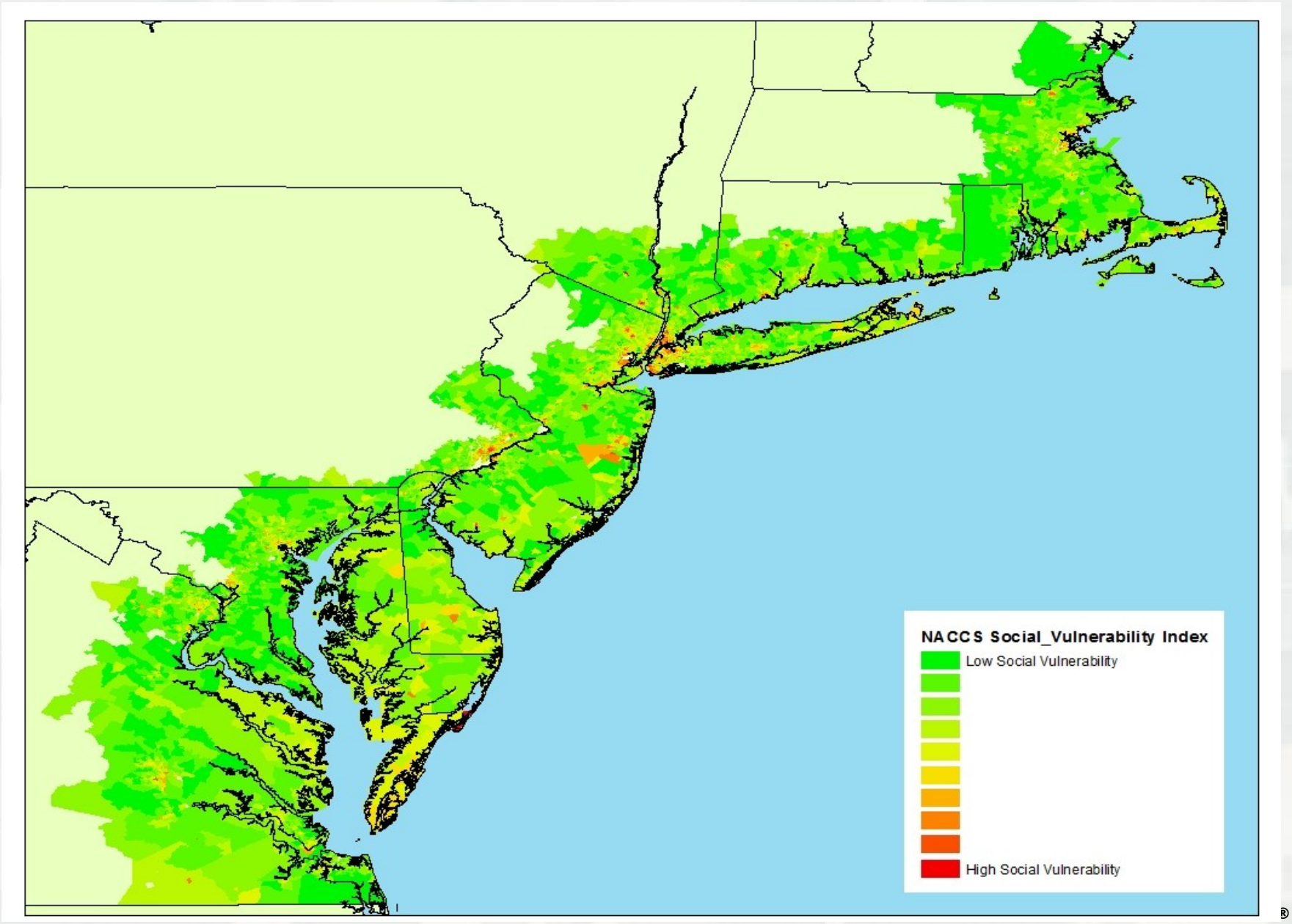
Infrastructure + Population Exposure Index



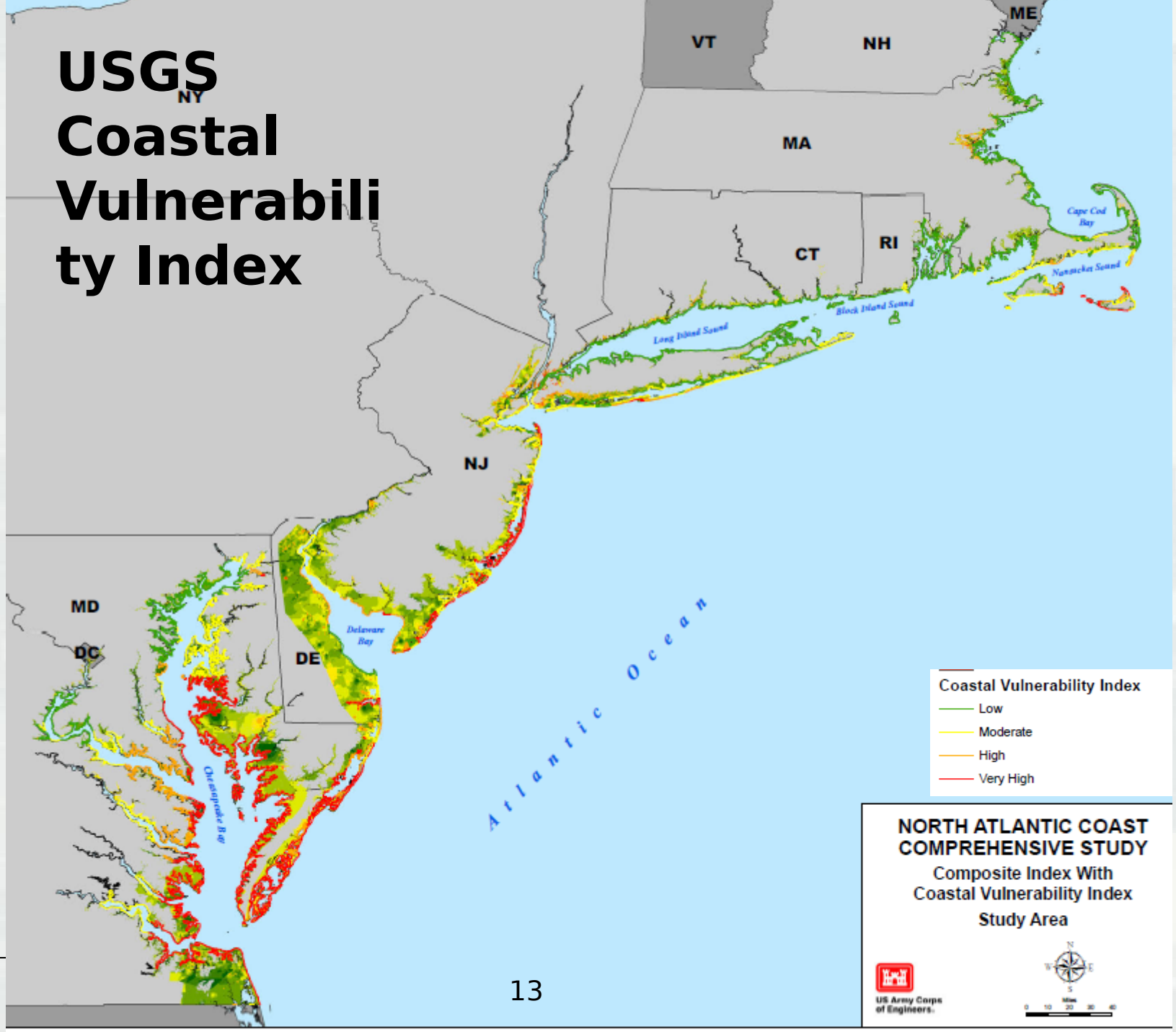
Infrastructure and Population Exposure Index : State of New Jersey



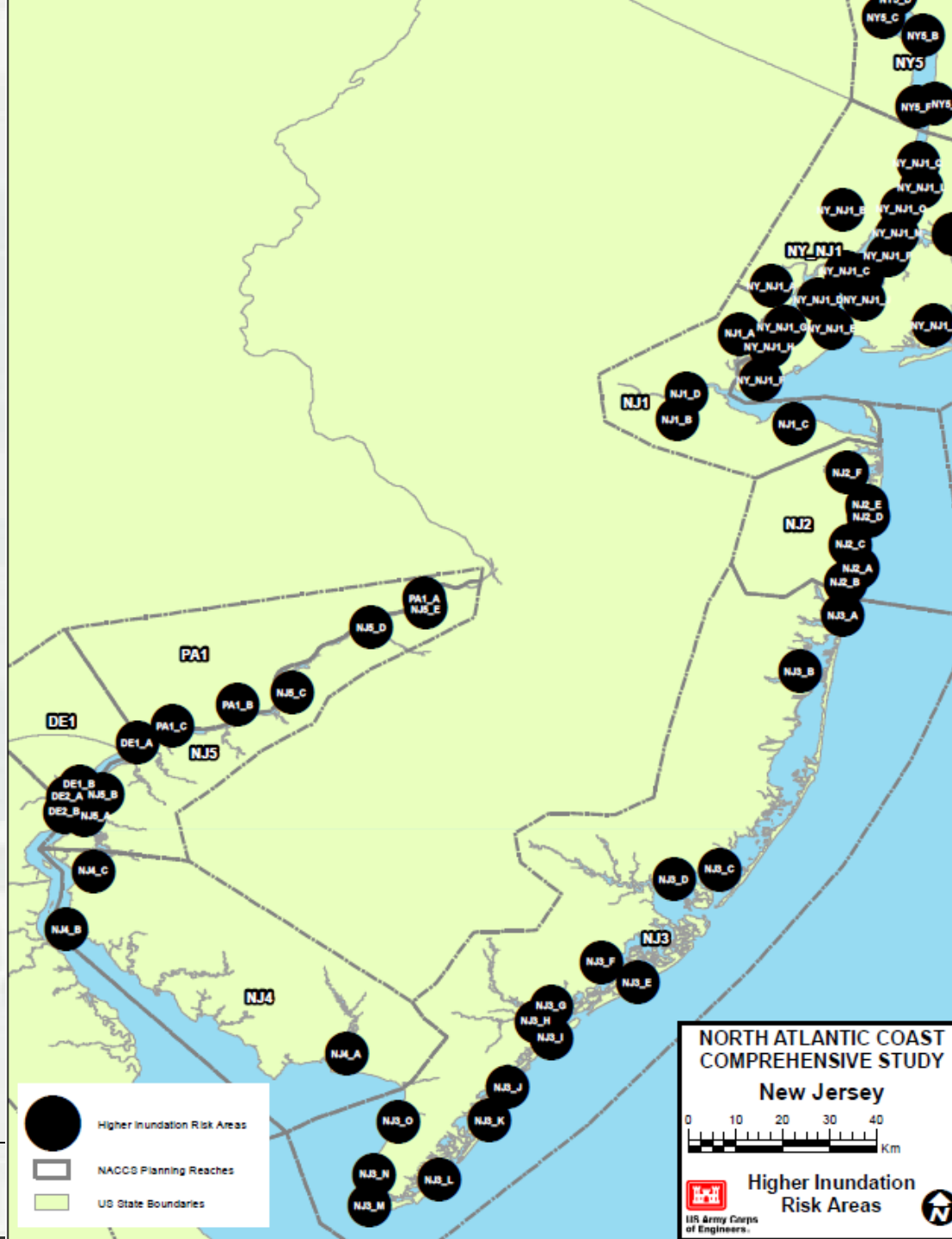
Social Vulnerability Index



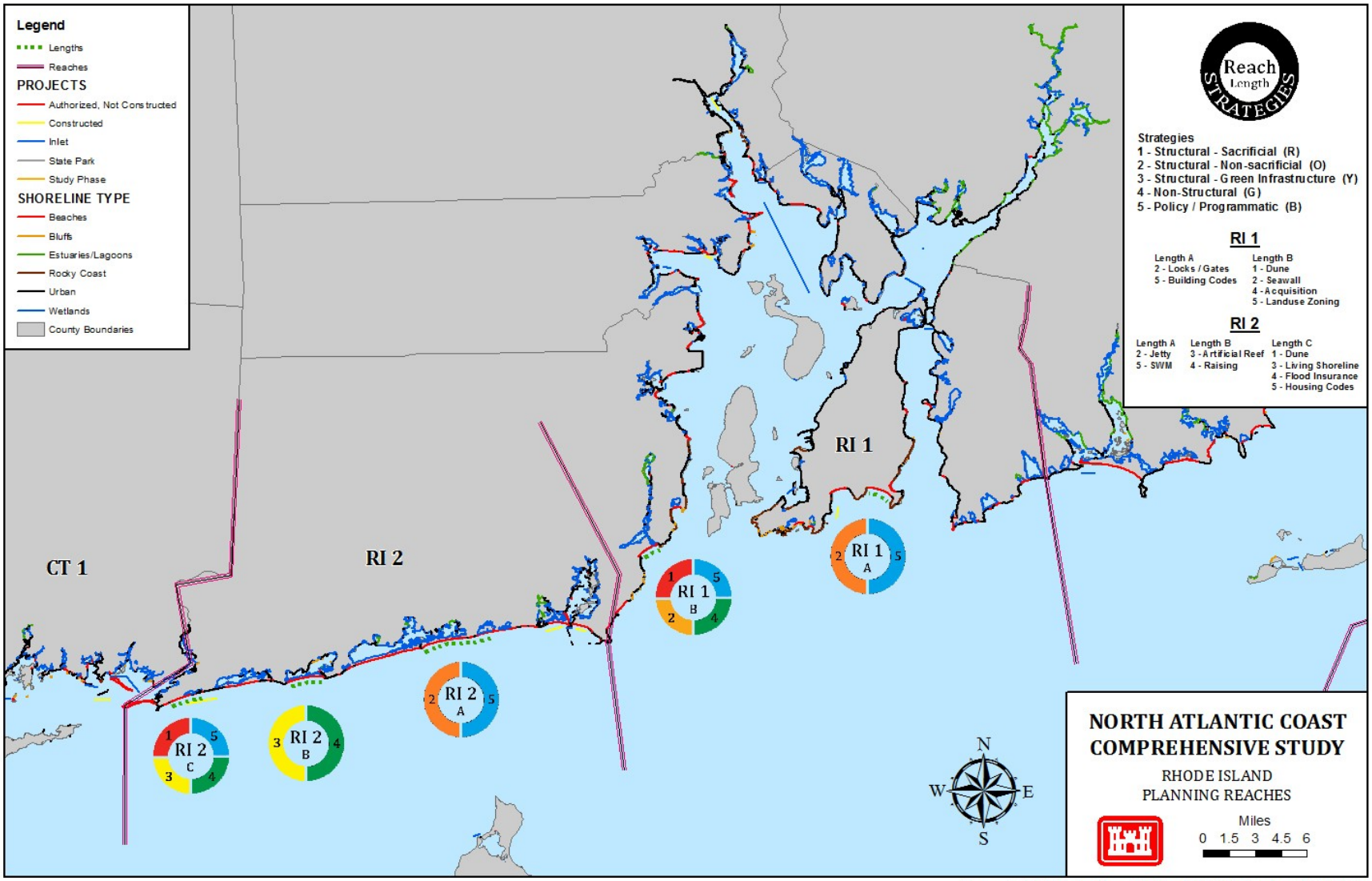
USGS Coastal Vulnerability Index



Problem Area Identification: State of New Jersey



Risk Reduction Framework Example Map



Questions/Discussion